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Maj. Gen. Joseph K. Bratton, Director
Division of Military Application

W. W. Burr, Jr., Deputy Director
Division of Biomedical and Environ-
mental Research

PREPARATION OF MATERIAL FOR AN ERDA RESPONSE TO THE
VERIFIED COMPLAINT, PEOPLE OF BIKINI VS ROBERT C.
SEAMANS, Jr., ET AL

At a meeting on November 21, 1975, between staff of OS, BER,
and MA, the development of a response for pertinent sections
of the one hundred and nineteen paragraphs in the verified
complaint, subject as above, was discussed. Cooperation by
the three divisions plus help from Dr. Robert Conard, BNL,
is needed. We are asking that representatives from each group
meet with us on December 1, 1975, to collect and edit material
for use by ERDA legal staff in responding to these complaints.
Dr. Conard has agreed to participate in a working session set for
11:00 a.m. that will likely take most of the day.

Enclosed find a draft of comments we had prepared earlier on a
portion of the complaints. Please bring to the meeting your
suggested statements for review and inclusion in a final paper
along with copies of any items you feel should be used as supporting

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15/
L. Joe Deal
Assistant Director for
Health Protection
Division of Operational Safety

As stated

cc w/enclosure:

Dr. Marks, BER R. Conard, BNL
Dr. Barr, BER Guy H. Cunningham, OGC
Cmdr. Wolff, MA
R. Ray, NV

OFFICE →	OS:SA:ADHP	OS:ADHP				
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DATE →	11/21/75	11/21/75				

ENCLOSURE

DRAFT
McCraw:nr
Operational Safety
11/12/75

COMMENTS ON THE VERIFIED COMPLAINTS

People of Bikini Vs Robert C. Seamans, Jr. et al

Para. 44. There are the following errors in this section:

- a. The BRAVO test was conducted on land. The device was not dropped from an airplane.
- b. The number of islands or portions of islands missing have not been established by the plaintiffs.
- c. An additional pass from ocean to lagoon was not created by this or any other test at Bikini Atoll.

Para. 59. This paragraph is misleading. The statement in quotes, "it would be radiologically safe to allow the Bikini people to return to their home atoll," was not made by the AEC Ad Hoc Committee and does not appear in their report. Rather, they ~~stated~~, "The exposures to radiation that would result from repatriation of the Bikini people do not offer a significant threat to their health and safety." Thus, radiation exposure is expected and while the risk is not zero, it was considered acceptable in light of benefits to be received. A copy of the Ad Hoc Committee's report is enclosed as TAB 1.

Para. 68. This statement as it relates to what AEC recommends is incorrect. Soil removal for all crop trees was not recommended, only for pandanus. Soil replacement was not recommended for any planting. See Part 2f., TAB 1.

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Para 70. This statement contains errors in facts:

- a. AEC recommended that for making concrete, sand from Bikini Island may be used and coral aggregate (already stockpiled and monitored) from the Peter-Oboe complex would be acceptable for buildings on Bikini and Eneu Islands. See TAB 2, letter from Biles to Coleman, June 12, 1970.
- b. A letter from ACME IMPORTERS to Dennis McBreen dated November 21, 1975, states that aggregate from the Peter-Oboe stockpile was used. See TAB 3.
- c. Results of radiological monitoring indicate that radiation levels inside the first houses constructed on Bikini Island is approximately 50 percent lower than outside the houses. This was expected provided materials of construction contained low levels of radioactivity. See TAB 4.

The results of this and other AEC recommendations can be visually checked and effectiveness confirmed by subsequent radiological monitoring. AEC/ERDA has agreed to provide followup to insure effectiveness of recommended remedial measures.

Para. 71. The statement in this paragraph is not entirely correct and is misleading. By letter of January 14, 1971, High Commissioner, Edward Johnston, ^{inquiry} required of the Manager, AEC Honolulu Area Office, about the safety of work crews planting coconuts in the

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Peter-Oboe complex (see TAB 5). Also, during a trip by Dr. Robert Conard of Brookhaven National Laboratory, he was asked whether work crews could drink well water on Bikini Island. The context of both the question and the answer provided in the letter from Dr. Biles of June 17, 1971, (TAB 6) ¹⁵ ~~in~~ use of well water by work crews. The answer does not apply to permanent residents wherein any radioactivity intake from use of well water would be added to intake from the rest of the diet consisting of locally grown foods. Except for fish and some coconut, the diet of a work crew would consist primarily of imported food. Use of well water by permanent residents of Bikini Island is a more complex question. ERDA is to provide additional guidance on use of well water on both Bikini and Eneu Islands when results of well water samples collected in June have been evaluated. This guidance will relate to radiological findings. Guidance on water quality considering its mineral or bacteriological content is more properly the responsibility of Trust Territory Health Officers and possibly Public Health Service.

Para. 72. The statement in this paragraph is completely wrong and very misleading. There was no construction of housing underway at Bikini Atoll in 1974 or since that time. The DOI effort during the 1974-75 period has been development of a Bikini Master Plan that contains plans for Phase II housing construction to begin

some time in the future. This planning was stopped awaiting advice from ERDA.

At a meeting in January 1975, with DOI and Trust Territory representatives and others, ERDA staff agreed to evaluate preliminary plans for Phase II housing construction provided by Trust Territory. Additional field work at Bikini Atoll was needed to develop more precise information on external radiation in areas identified in the plan for additional housing construction and to update calculations of total radiation dose for future residents of Bikini and Eneu Islands. An important feature of these calculations would be forecast of doses received at future times when locally grown foods would come to be a major part of the diet. These foods, not yet available in any quantity, would include new items not known to have been grown in the atoll in the past.

A detailed survey of external gamma radiation levels on Bikini and Eneu Islands was conducted by ERDA and ERDA contractor ground monitors in June 1975 after support for an aerial survey from DOD could not be obtained. Responding to pressures from DOI and Trust Territory representatives for early advice on location of the second group of houses, preliminary results of the June 1975 survey and draft conclusions and recommendations were presented at a meeting in August 1975. Dose estimates for external radiation for six options with residence on Bikini and

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Eneu Islands were presented. These were on a firm basis since results of the external radiation portion of the survey were available a few weeks after the survey.

Dose estimates for internal exposures based on June 1975 results could not be made since laboratory analysis of collected samples would take many months. Rough estimates of internal dose were made using analogy with Enewetak findings. The tentative conclusion presented was that while houses already constructed on Bikini Island could be occupied with radiation doses held within prescribed guidelines, given a choice, any additional construction of houses should be on Eneu Islands where radiation exposures are known to be lower than Bikini Island. Trust Territory staff agreed to revise their plans. ERDA agreed to provide additional guidance in about six months when laboratory analysis of samples would be completed. TAB 7 is a copy of the draft preliminary report reviewed at the January 15, 1975, planning meeting.

Para. 73. This statement of the planning meeting of January 15, 1975, is not entirely factual. What Dr. Biles said was that Federal Regulations regarding radiological safety had become more stringent in their application since 1968 when the decision to return the Bikini people to their atoll was made. The basic numerical radiation standards for protection of the public are the same now as in 1968. More emphasis is being given to keeping exposures as low as practicable.

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Para. 77. This paragraph is very misleading and does not present all of the facts. For the purpose intended, the June 1975 survey of Bikini and Eneu Islands by ground monitors is entirely satisfactory. That purpose was to answer the Trust Territory question of location of the Phase II houses on Bikini and Eneu Islands. Contrary to the statement attributed to Mr. Hughes, the ground survey was most successfully accomplished using portable and vehicle mounted instruments.

The optimal technique referred to is the use of airborne instruments flown over the islands in helicopters. This method of radiological monitoring can be put into perspective as follows:

- a. Aerial survey of Bikini Island (Atoll) would be valuable as a screening technique for determining the external gamma field and contributing gamma emitters in the surface soil. Large areas and many islands can be covered quickly. Field evaluation of results, as they are obtained, are used to indicate where additional survey work on the ground is needed.
- b. Estimates of levels of ^{239}Pu in the surface soil can be obtained by measuring gamma radiation from a companion radionuclide that is present along with the plutonium.
- c. Information can be obtained over shallow water areas along the reef and in other areas on land not easily accessible due to dense vegetation cover. Bikini and Eneu Islands are very accessible on foot and by vehicles.

It is doubtful if an aerial survey would add significantly to dose calculations for residents of Bikini and Eneu islands derived from the grid of many ground points monitored on these islands in June 1975. A possible exception would be information on plutonium from an aerial survey ^{as} ~~or~~ it would add to the body of data obtained by soil sampling. Results of greatest value would be from an aerial survey of other islands in the atoll that are relatively inaccessible on foot. This information would be unrelated to the question of where to build houses on Bikini or Eneu Islands.

Para. 80. The statement of general impact of preliminary reports presented by ERDA is incorrect.

The applicable Federal standards for the general public, and these are shown in the reports referenced in paragraph 79, are:

- a. 0.5 Rem/yr whole body and bone marrow.
- b. 5 Rem/30 yrs. whole body.

These doses are from man-made radioactivity, not including natural background. Natural external background at Bikini Atoll is:

- a. 0.027 Rem/yr.
- b. 0.80 Rem/30 yrs.

The external radiation values given in Table 4 of the draft report, "Preliminary Report, Radiological Evaluation of Phase II Housing Construction, Bikini Atoll - August 1975," include contribution

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to exposure from natural background. To compare these values with the standards, background must be subtracted out. Case 2 in Table 4 applies to houses already completed and Cases 5 and 6 apply to houses being planned for the interior of Bikini Island. The estimated external doses for comparison with the standards are as follows:

Case 2

Annual whole-body and bone marrow dose = $0.20 - 0.027 = 0.173$ Rem/yr.

30 year whole body dose = $4.16 - 0.80 = 3.36$ Rem/30 yrs.

Cases 5 and 6

Annual whole-body and bone marrow dose = $0.28 - 0.027 = 0.253$ Rem/yr.

30-year whole body dose = $5.59 - 0.80 = 4.79$ Rem/30 yrs.

These values do not exceed the standards although the 30-year dose estimate for external radiation alone for Cases 5 and 6 is very near the standard. There are two important considerations to keep in mind. First, that the standards apply to total dose from external and internal radioactivity. The major potential contributors to internal dose are certain terrestrial foods grown on Bikini Island and not yet available in any quantity to island residents. Second, the Federal standards are not considered limits. They do not present a dividing line between safe and unsafe conditions.

As for the recommendation that well water on Bikini Island be used only for agricultural purposes, this is entirely in accord with past recommendations. The letter of June 17, 1971, referenced in comments on Paragraph 71, indicated well water was acceptable

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for use by work crews who would be temporary residents using mainly imported foods. As for use of well water by permanent residents, the letter states, "At this point in time, we cannot say how much fresh water is available as ground water at Bikini Island or whether this source is an adequate supply for those who return. We urge that the residents not rely on ground water as a source of drinking water and that provisions be made to collect and store rain water as was done in the past." A rain catchment system has been included in each new house on Bikini Island, and ERDA dose assessments assume that residents will drink this rain water, not well water.

Para. 82. The apprehension and concern for health being expressed by members of the Bikini people and the demands for medical examinations and treatment of injuries for those who have lived for a time on Bikini Island is a new element in the rehabilitation of Bikini Atoll. Those experts who made the judgement in 1968 on whether or not to recommend that the Bikini people be returned to their atoll, were confronted with two types of information. On the one hand, there were the results of past radiological surveys of the atoll and dose evaluations by Dr. Philip Gustafson indicating that radiation exposures near Federal standards for the general public are to be expected. On the other hand, there was a report by James T. Hiyane, District Agriculturist, indicating that the Bikini

people on Kili are resentful and dissatisfied with life on Kili, they want to go home, and they anticipate a return to Bikini and have no desire to exert energy in improving Kili. Also there was a report by Jack A. Tobin, Anthropologist, indicating the people have experienced difficulty adjusting to Kili, they have feelings of isolation and confinement, they refuse to accept the move to Kili as final, they say Kili is no good, it is like a prison, there is not enough food, and they have not made a whole-hearted attempt to adjust to Kili and want to return to Bikini.

The small risk associated with radiation exposures near the standards was found by the experts to be acceptable when viewed along side the great benefits to be received. The benefits overbalanced the risks to a considerable degree. In the seven years since the judgement on resettlement, the radiation standards have not changed although there is somewhat more conservative application. What has changed is the benefit side of the equation. Considering the fear that has prompted demands for medical evaluation and treatment of any injuries for those who have lived a year or more on Bikini Island, it could be that the benefit-risk balance of 1968 is no longer valid. If the people will accept no risk at all, or control of exposures within the standards, then return to Bikini Atoll is not feasible.

Para. 83. The terms "safe" and "unsafe" are used in this section without a proper definition or basis for common understanding.

Using these terms as absolutes, i. e., safe means that the chance

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of injury must be zero and unsafe means the chance of injury is 100 percent, leads to the conclusion that Bikini Atoll is unsafe and will be for thousands of years to come. By the same definition, Kili and the rest of the earth are also unsafe due to worldwide fallout, cosmic rays from space, and radiation from naturally occurring terrestrial radioactivity.

A fundamental ^{assumption} for radiation protection consideration, and this is very conservative, is that every amount of radiation exposure carries with it some chance of effect or injury, no matter how small. If one demands that risks of injury from radiation exposure be zero, then radiation exposures must be zero. The radiation standards themselves are not a dividing line between safety and danger. The standards for protecting the public are exposure levels set sufficiently low that associated risks would be found acceptable, by an informed society, when viewed along side expected benefits. Risks of radiation exposure at levels within the standards are comparable with other risks accepted in normal every day life.

The AEC/ERDA effort has been to find a way to keep exposures of Bikini Atoll residents within the standards using feasible and practicable remedial measures. These measures have already been recommended. Short of removal and replacement of the land, which is not a feasible action, external radiation exposures

for residents living in the new houses on Bikini Island will be a significant portion of the annual and 30-year standards. See comments on Para. 80. Estimates of external exposures for residents of Eneu Island indicate values approximately half that for Bikini Island. See reports referenced in Para. 79. This was the reason for the recommendation by the experts in 1968 that the first houses be built and food crops placed on Eneu Island.

Para. 86. The statement that restrictions not previously disclosed to the people were released in preliminary reports in August 1975 is untrue. As the plans for resettlement have been better defined through development of a "Master Plan," additional advice in the form of recommendations has been developed. From the very first reports and during the visit to Kili by the then High Commissioner Norwood in August 1968, the AEC/ERDA position presented was one of limited use of islands of the atoll with restrictions on which island could be used for permanent residents and restrictions regarding production and use of local foods. Only the island of Eneu was recommended to be free of restrictions. This is part b. of the second recommendation of the report of the Ad Hoc Committee, Namely, "Establish the first village and immediate food crops on Eneu. No radiological precautions will be needed on Eneu because of its very low contamination level."

These recommendations were presented to the people through an interpreter during Mr. Norwood's visit.

It was recognized in 1968 that there would be a desire to plant certain food crops on Bikini Island that have a long time to maturity. A precaution for removal of two inches of topsoil was presented by the Ad Hoc Committee for planting pandanus based on the best information available. It appears now, based on additional radiological survey results from Bikini and Enewetak Atolls, that this will not be sufficient to keep down levels of radionuclides in this plant since radioactivity in the soil where roots grow extends deep into the ground. Other food plants have been planted on Bikini Island that were never found there during the peoples' absence. These have been sampled and as information accumulates on their radioactive content, recommendations on their use are made. As new things are learned about ways to reduce radiation exposures, additional advice will be given the Department of the Interior for their use at Bikini Atoll.

As for living patterns different from normal, estimates of external exposure presented in August 1975 were based on information developed for the Enewetak people as to time that may be spent in various locations in the atoll. These represent approximate values expected to apply to different age groups and for men and women. These are assumptions, not recommendations or restrictions, based on observations of people living in an atoll where there is non-intensive agriculture and copra production. Contrary to any other views, the geographical living patterns (percentage of time

spent in various locations) used in the calculations in the preliminary AEC/ERDA reports presented in August 1975, are identical to assumptions used for the Enewetak external dose calculations. These are presented in Table 19, page 126, of Vol. I, "Enewetak Radiological Survey," October 1973.

Para. 87. The statement that AEC had not recommended construction of houses on Bikini Island is essentially correct. AEC did recommend that the first house be constructed on Eneu. It is our understanding from Trust Territory representatives who worked with the Bikini people on exact locations for houses, that the Bikini people rejected this advice and required that the houses be built on Bikini Island instead.

Para. 89. This paragraph contains erroneous conclusions. The August 1975 reports referenced in Para. 79 did not recommend against use of permanent residences on Bikini Island. Rather, the preliminary report entitled "Radiological Evaluation of Phase II housing Construction, Bikini Atoll-August 1975," page 8, contains a summary of conclusions regarding six different cases of assumed living patterns and remedial measures. The report states, "Case 2 appears to offer the best compromise if the restrictions are acceptable to the people." Case 2 is defined in Table 1 of the report as follows:

"Case 2 - Limited use of Bikini Island with residence in houses already constructed. No additional house construction on Bikini Island for the present. No use of food grown on Bikini Island

for the present except coconut. Unrestricted use of fish from all parts of the atoll. Production of land food crops on Eneu Island only, except coconut. Use of Bikini Island lens water for agriculture only. Build and additional houses on Eneu Island." (Emphasis added).

In the same report, page 9, Recommendation 2 is stated as follows:

"2. No additional houses be constructed along the Lagoon Road (Fig. 1, Areas 1 and 2) on Bikini Island. Although the existing houses along the lagoon road may be occupied within prescribed guidelines, we feel that the construction of additional housing in this area is ill-advised as long as alternative locations exist which will result in significantly lower doses, (i. e., Eneu). This recommendation is consistent with earlier ERDA (AEC) pronouncements on the advisability of locating the first houses on Eneu." (Emphasis added.)

Para. 94. With the completion of cleanup by DOD in 1969, the role and responsibility of AEC/ERDA with regard to rehabilitation of Bikini Atoll, was to perform radiological surveys of the environment and to evaluate, assess, and interpret radiological findings. ERDA/AEC has provided this information to DOI who

has responsibility for the safety and welfare of the Bikini people. ERDA/AEC has not performed a regulatory function and any recommendations made to DOI were in the form of advice and did not have the force of law. It was and is the position of ERDA that its activities relative to Bikini Atoll do not require that an environmental impact statement (EIS) be first prepared. Such radiological survey activities provide partial input for an EIS by DOL. Any preparation of participation by AEC/ERDA staff in review of conditions with Bikini people, as in the September 1975 visit, was done at the request of DOI and Trust Territory and in support of their responsibilities.

Para. 99. ERDA disagrees with certain of these alleged failures.

- a. The technology used to conduct radiological surveys of Bikini Atoll is completely acceptable for developing a data base for estimating future radiation exposures at Bikini Atoll.
- b. AEC/ERDA has not been responsible to obtain and fund independent assessments and no one seeking to perform such assessments has been denied information on survey results.

The Ad Hoc committee who advised AEC in 1968 was composed of recognized experts including a representative of the Federal Radiation Council (FRC). The FRC was charged with responsibility for development of radiation

standards for use by Federal agencies and for advising the President on radiation matters. The standards used to evaluate the Bikini Atoll environment were those developed by FRC. The responsibility for Federal radiation standards was assigned to the Environmental Protection Agency (EPA) in 1970. EPA has not changed the FRC standards for the general public. The ERDA position is that radiological findings at Bikini Atoll, related to doses to future residents, are to be evaluated using a conservative application of current Federal standards along with the admonition by FRC that radiation exposures are to be kept as low as practicable. This is the same approach as that taken in the EIS for Enewetak. ERDA maintains liaison with appropriate EPA staff to keep them informed of radiological matters at Bikini Atoll and to seek their advice. Considering that the basic standards have not been changed, there should be little question of their continuing applicability for Bikini residents. International standards promulgated by ICRP are very nearly the same as those of FRC and use of those guides would not significantly change conclusions and recommendations.

- c. The responsibilities of ERDA are to conduct radiological surveys that will develop valid technical information and to apply current Federal radiation standards in their proper

context. While concerned for humanitarian reasons, ERDA cannot assume ^{responsibility for} communication of its findings and recommendations from DOI to TT and to the people or make sure of the people's understanding. The initiative for achieving such understanding must come from DOI and TT with assistance from ERDA. The initiative for communicating their feelings and concerns rests with the Bikini people. It appears that for whatever reasons, the people and their leaders first expressed the benefits they expected for return to their atoll. Some years later, faced with the actual return, they are expressing their concerns. There is an indication that during early contacts the people did not express all of their feelings for fear this would influence the decision on whether or not they could return. The reports reviewed by the Ad Hoc Committee contain no statements regarding the peoples apprehensions.

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